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CENTRAL FAX CENTER****DATE:** August 8, 2005**AUG 08 2005****PTO IDENTIFIER:** Application Number 10/518449  
**MS Missing  
Parts****Inventor:** Thomas Heidemann et al.**MESSAGE TO:** US Patent and Trademark Office**FAX NUMBER:** (571) 273-8300**FROM:** CONNOLLY BOVE LODGE & HUTZ LLP  
Ashley I. Pezzner**PHONE:** (302) 658-9141**Attorney Dkt. #:** 12810-00003-US**PAGES (Including Cover Sheet):** 9**CONTENTS:**Transmittal Of Translation Of International Preliminary Examination Report (1 page)  
Translation Of International Preliminary Examination Report (6 pages)  
Certificate of Transmission (1 page)

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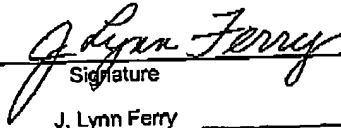
Application No. (if known): 10/518449

Attorney Docket No.: 12810-00003-US

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Transmittal Of Translation Of International Preliminary Examination  
Report (1)  
Translation Of International Preliminary Examination Report

AUG. 8. 2005 3:40PM

NO. 7410 P. 3/9  
Docket No.: 12810-00003-US

Application No.: 10/518449

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**RECEIVED  
CENTRAL FAX CENTER**

**AUG 08 2005**

In re Patent Application of:  
Thomas Heidemann et al.

Application No.: 10/518449

Group Art Unit: N/A

Filed: December 20, 2004

Examiner: Not Yet Assigned

For: OLIGOMERIZATION OF ALKENES IN A  
PLURALITY OF SUCCESSIVE,  
HETEROGENEOUS CATALYST ZONES

**TRANSMITTAL OF TRANSLATION OF INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

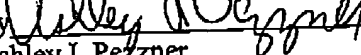
MS Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Applicant submits herewith a translation of the International Preliminary Examination Report ("IPER"). Each referenced cited in the IPER has been cited by Applicant in an Information Disclosure Statement filed with this application. The International Bureau of WIPO has deemed that claims 1-7 are novel, have inventive step and industrial applicability.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 03-2775, under Order No. 12810-00003-US.

Respectfully submitted,

By   
Ashley L. Pezzner

Registration No.: 35,646  
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AUG. 8. 2005 3:40PM

PATENT COOPERATION TREATY

NO. 7410<sup>2</sup>C1P. 4/9/000000

From the INTERNATIONAL BUREAU

US-Connolly

PCT

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT  
(PCT Rule 72.2)

To:

BASF AKTIENGESELLSCHAFT  
67056 Ludwigshafen  
ALLEMAGNE

Patente, Marken u. Lizenzen  
24. März 2005

*[Signature]*

Date of mailing (day/month/year)  
17 March 2005 (17.03.2005)

Applicant's or agent's file reference  
0000053680

International application No.  
PCT/EP2003/006838

IMPORTANT NOTIFICATION

International filing date (day/month/year)  
27 June 2003 (27.06.2003)

Applicant

BASF AKTIENGESELLSCHAFT et al

*AST*

1. Transmittal of the translation to the applicant.

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

2. Transmittal of the copy of the translation to the elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

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3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Agnes Wittmann-Regis

Facsimile No. +41 22 338 89 70

*AM*



## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000053680	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/006838	International filing date (day/month/year) 27 June 2003 (27.06.2003)	Priority date (day/month/year) 03 July 2002 (03.07.2002)
International Patent Classification (IPC) or national classification and IPC C07C 11/08		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 25 November 2003 (25.11.2003)	Date of completion of this report 03 May 2004 (03.05.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

Form PCT/IPEA/409 (cover sheet) (January 1994)

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/006838

## I. Basis of the report

1. This report has been drawn on the basis of (Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.):

- ☐ the international application as originally filed.
- ☒ the description, pages 1-10, as originally filed,  
 pages \_\_\_\_\_, filed with the demand,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims, Nos. \_\_\_\_\_, as originally filed,  
 Nos. \_\_\_\_\_, as amended under Article 19,  
 Nos. \_\_\_\_\_, filed with the demand,  
 Nos. 1-7, filed with the letter of 13 February 2004 (13.02.2004),  
 Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings, sheets/fig 1/1, as originally filed,  
 sheets/fig \_\_\_\_\_, filed with the demand,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
 sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

## 2. The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

## 4. Additional observations, if necessary:

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

 International application No.  
 PCT/EP 03/06838

 V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
 citations and explanations supporting such statement

1. Statement			
Novelty (N)	Claims	1-7	YES
	Claims		NO
Inventive step (IS)	Claims	1-7	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims		NO

## 2. Citations and explanations

D1 DE 199 57 173  
 D2 WO 99 25 668  
 D3 DE 199 22 038.

Documents D1 and D2 are cited in the application.

1. Amendments

Claims 3 and 4 were reworded insofar as the references to individual WO documents were replaced with the wording of the claims concerned (claim 1 in the case of WO 01 37 989 and claim 7 in the case of WO 95 14 647). These corrections do not go beyond the subject matter of the international application as filed and therefore meet the requirement of PCT Article 34(2)(b).

2. Novelty

Methods for the oligomerization of alkenes in the presence of a solid sulphur and nickel catalyst are known from documents D1-D3, wherein the reaction can be carried out in either a tube reactor or a reactor cascade (D1, page 4, lines 20-3 and examples; D2, page 5, lines 35-47, and page 6, line 22, to page 7, line 8, and page 8, line 10, to

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page 9, line 2; D3). In document D1 the molar ratio of S/Ni is 0.25-0.38. In document D3 the catalyst volume is distributed among the reaction zones in such a way that the temperature variations occurring in the individual reaction zones are as uniformly high as possible.

Since the prior art documents D1 to D3 offer nothing to suggest different molar S/Ni ratios in the different (at least two) reaction zones, claims 1 to 7 must be considered novel.

### 3. Inventive step

The method known from the closest prior art document, D1, differs from the present method in that the molar S/Ni ratio is the same in both reaction zones and less than 0.5. The object of the present application is to provide a further method for the oligomerization of an alkene stream in a solid sulphur and nickel catalyst by means of an improved catalyst bed. As a solution the applicant proposes the method according to claim 1, which is characterized by a fixed catalyst bed divided into two or more adjacent catalyst zones, each catalyst zone being characterized by a defined molar S/Ni ratio, with the first zone having a ratio of less than 0.5 and the second or last one a ratio of more than 0.5,

The advantages of the method according to the invention are shown in the examples, that is a high alkene conversion rate with a low degree of branching (page 6, lines 11-19; page 8, lines 34-45 and table 3). Comparative examples 1 and 3 of table 3 illustrate the method according to document D1. The conversion rates are accordingly poorer than those obtained with the present method. Consequently, the method according to claims 1 to



## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
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7 involves an inventive step.

3. Certain defects in the international application  
Certain observations on the international  
application

The phrase "hereby full reference is made in this regard"  
should be deleted from the description (PCT Examination  
Guidelines, paragraph II-4.18).